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<110> Boutilier, Kim
Ouellet, Therese
Custers, Jan
Hattori, Jiro
Miki, Brian
Van Lookeren Campagne, Michiel

<120> USE OF THE BNM3 TRANSCRIPTIONAL ACTIVATOR TO CONTROL PLANT EMBRYOGENESIS AND REGENERATION PROCESSES

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<213> Arabidopsis thaliana

<400> 7

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20 25 30

Ala Gly Gly Tyr Cys Phe Asp Leu Ala Ala Pro Ser Asp Glu Ser Ser
35 40 45

Ala Val Gln Thr Ser Phe Leu Ser Pro Phe Gly Val Thr Leu Glu Ala
50 55 60

Phe Thr Arg Asp Asn Asn Ser His Ser Arg Asp Trp Asp Ile Asn Gly
65 70 75 80

Gly Ala Cys Asn Thr Leu Thr Asn Asn Glu Gln Asn Gly Pro Lys Leu
85 90 95

Glu Asn Phe Leu Gly Arg Thr Thr Thr Ile Tyr Asn Thr Asn Glu Thr
100 105 110

Val Val Asp Gly Asn Gly Asp Cys Gly Gly Gly Asp Gly Gly Gly Gly
115 120 125

Gly Ser Leu Gly Leu Ser Met Ile Lys Thr Trp Leu Ser Asn His Ser
130 135 140

Val Ala Asn Ala Asn His Gln Asp Asn Gly Asn Gly Ala Arg Gly Leu
145 150 155 160

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Ser Leu Ser Met Asn Ser Ser Thr Ser Asp Ser Asn Asn Tyr Asn Asn
                165                 170                 175

Asn Asp Asp Val Val Gln Glu Lys Thr Ile Val Asp Val Val Glu Thr
            180                 185                 190

Thr Pro Lys Lys Thr Ile Glu Ser Phe Gly Gln Arg Thr Ser Ile Tyr
        195                 200                 205

Arg Gly Val Thr Arg His Arg Trp Thr Gly Arg Tyr Glu Ala His Leu
    210                 215                 220

Trp Asp Asn Ser Cys Lys Arg Glu Gly Gln Thr Arg Lys Gly Arg Gln
225                 230                 235                 240

Val Tyr Leu Gly Gly Tyr Asp Lys Glu Glu Lys Ala Ala Arg Ala Tyr
                245                 250                 255

Asp Leu Ala Ala Leu Lys Tyr Trp Gly Pro Thr Thr Thr Thr Asn Phe
            260                 265                 270

Pro Leu Ser Glu Tyr Glu Lys Glu Val Glu Glu Met Lys His Met Thr
        275                 280                 285

Arg Gln Glu Tyr Val Ala Ser Leu Arg Arg Lys Ser Ser Gly Phe Ser
    290                 295                 300

Arg Gly Ala Ser Ile Tyr Arg Gly Val Thr Arg His His Gln His Gly
305                 310                 315                 320

Arg Trp Gln Ala Arg Ile Gly Arg Val Ala Gly Asn Lys Asp Leu Tyr
                325                 330                 335

Leu Gly Thr Phe Gly Thr Gln Glu Glu Ala Ala Glu Ala Tyr Asp Ile
            340                 345                 350

Ala Ala Ile Lys Phe Arg Gly Leu Ser Ala Val Thr Asn Phe Asp Met
        355                 360                 365

Asn Arg Tyr Asn Val Lys Ala Ile Leu Glu Ser Pro Ser Leu Pro Ile
    370                 375                 380

Gly Ser Ser Ala Lys Arg Leu Lys Asp Val Asn Asn Pro Val Pro Ala
385                 390                 395                 400

Met Met Ile Ser Asn Asn Val Ser Glu Ser Ala Asn Asn Val Ser Gly
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405 410 415

Trp Gln Asn Thr Ala Phe Gln His His Gln Gly Met Asp Leu Ser Leu
420 425 430

Leu Gln Gln Gln Gln Glu Arg Tyr Val Gly Tyr Tyr Asn Gly Gly Asn
435 440 445

Leu Ser Thr Glu Ser Thr Arg Val Cys Phe Lys Gln Glu Glu Glu Gln
450 455 460

Gln His Phe Leu Arg Asn Ser Pro Ser His Met Thr Asn Val Asp His
465 470 475 480

His Ser Ser Thr Ser Asp Asp Ser Val Thr Val Cys Gly Asn Val Val
485 490 495

Ser Tyr Gly Gly Tyr Gln Gly Phe Ala Ile Pro Val Gly Thr Ser Val
500 505 510

Asn Tyr Asp Pro Phe Thr Ala Ala Glu Ile Ala Tyr Asn Ala Arg Asn
515 520 525

His Tyr Tyr Tyr Ala Gln His Gln Gln Gln Gln Gln Ile Gln Gln Ser
530 535 540

Pro Gly Gly Asp Phe Pro Val Ala Ile Ser Asn Asn His Ser Ser Asn
545 550 555 560

Met Tyr Phe His Gly Glu Gly Gly Gly Glu Gly Ala Pro Thr Phe Ser
565 570 575

Val Trp Asn Asp Thr
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<213> Artificial

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cataaggaga gagagaaaag cctaaccagt 30

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accaagaact cgttagatc 19

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aacgcatata actaaagatc 20

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<400> 14
aaattctcaa gctttggtcc atcttg 26

<210> 15
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<213> Arabidopsis thaliana

<400> 15

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Asn Leu Leu Gly Phe Ser Leu Ser Ser Asn Met Met Lys Met Gly Gly
20 25 30

Arg Gly Gly Arg Glu Ala Ile Tyr Ser Ser Ser Thr Ser Ser Ala Ala
35 40 45

Thr Ser Ser Ser Ser Val Pro Pro Gln Leu Val Val Gly Asp Asn Thr
50 55 60

Ser Asn Phe Gly Val Cys Tyr Gly Ser Asn Pro Asn Gly Gly Ile Tyr
65 70 75 80

Ser His Met Ser Val Met Pro Leu Arg Ser Asp Gly Ser Leu Cys Leu
85 90 95

Met Glu Ala Leu Asn Arg Ser Ser His Ser Asn His His Gln Asp Ser
100 105 110

Ser Pro Lys Val Glu Asp Phe Phe Gly Thr His His Asn Asn Thr Ser
115 120 125

His Lys Glu Ala Met Asp Leu Ser Leu Asp Ser Leu Phe Tyr Asn Thr
130 135 140

Thr His Glu Pro Asn Thr Thr Thr Asn Phe Gln Glu Phe Phe Ser Phe
145 150 155 160

Pro Gln Thr Arg Asn His Glu Glu Glu Thr Arg Asn Tyr Gly Asn Asp
165 170 175

Pro Ser Leu Thr His Gly Gly Ser Phe Asn Val Gly Val Tyr Gly Glu
180 185 190

Phe Gln Gln Ser Leu Ser Leu Ser Met Ser Pro Gly Ser Gln Ser Ser
195 200 205

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Cys Ile Thr Gly Ser His His His Gln Gln Asn Gln Asn Gln Asn His
    210                 215                 220

Gln Ser Gln Asn His Gln Gln Ile Ser Glu Ala Leu Val Glu Thr Ser
225                 230                 235                 240

Val Gly Phe Glu Thr Thr Thr Met Ala Ala Ala Lys Lys Lys Arg Gly
                245                 250                 255

Gln Glu Asp Val Val Val Val Gly Gln Lys Gln Ile Val His Arg Lys
            260                 265                 270

Ser Ile Asp Thr Phe Gly Gln Arg Thr Ser Gln Tyr Arg Gly Val Thr
        275                 280                 285

Arg His Arg Trp Thr Gly Arg Tyr Glu Ala His Leu Trp Asp Asn Ser
    290                 295                 300

Phe Lys Lys Glu Gly His Ser Arg Lys Gly Arg Gln Val Tyr Leu Gly
305                 310                 315                 320

Gly Tyr Asp Met Glu Glu Lys Ala Ala Arg Ala Tyr Asp Leu Ala Ala
                325                 330                 335

Leu Lys Tyr Trp Gly Pro Ser Thr His Thr Asn Phe Ser Ala Glu Asn
            340                 345                 350

Tyr Gln Lys Glu Ile Glu Asp Met Lys Asn Met Thr Arg Gln Glu Tyr
        355                 360                 365

Val Ala His Leu Arg Arg Lys Ser Ser Gly Phe Ser Arg Gly Ala Ser
    370                 375                 380

Ile Tyr Arg Gly Val Thr Arg His His Gln His Gly Arg Trp Gln Ala
385                 390                 395                 400

Arg Ile Gly Arg Val Ala Gly Asn Lys Asp Leu Tyr Leu Gly Thr Phe
                405                 410                 415

Gly Thr Gln Glu Glu Ala Ala Glu Ala Tyr Asp Val Ala Ala Ile Lys
            420                 425                 430

Phe Arg Gly Thr Asn Ala Val Thr Asn Phe Asp Ile Thr Arg Tyr Asp
        435                 440                 445

Val Asp Arg Ile Met Ser Ser Asn Thr Leu Leu Ser Gly Glu Leu Ala
    450                 455                 460
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Arg Arg Asn Asn Asn Ser Ile Val Val Arg Asn Thr Glu Asp Gln Thr
465                 470                 475                 480

Ala Leu Asn Ala Val Val Glu Gly Gly Ser Asn Lys Glu Val Ser Thr
                485                 490                 495

Pro Glu Arg Leu Leu Ser Phe Pro Ala Ile Phe Ala Leu Pro Gln Val
            500                 505                 510

Asn Gln Lys Met Phe Gly Ser Asn Met Gly Gly Asn Met Ser Pro Trp
        515                 520                 525

Thr Ser Asn Pro Asn Ala Glu Leu Lys Thr Val Ala Leu Thr Leu Pro
    530                 535                 540

Gln Met Pro Val Phe Ala Ala Trp Ala Asp Ser
545                 550                 555
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<210> 16
<211> 485
<212> PRT
<213> Sea mays

<400> 16

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Met Asp Met Asp Met Ser Ser Ala Tyr Pro His His Trp Leu Ser Phe
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Ser Leu Ser Asn Asn Tyr His His Gly Leu Leu Glu Ala Phe Ser Asn
            20                  25                  30

Ser Ser Gly Thr Pro Leu Gly Asp Glu Gln Gly Ala Val Glu Glu Ser
        35                  40                  45

Pro Arg Thr Val Glu Asp Phe Leu Gly Gly Val Gly Cys Val Gly Ala
    50                  55                  60

Pro Arg Ser Arg Arg Leu Gln Ile Arg Ile Thr Ser Leu Cys Ala Ala
65                  70                  75                  80

Ser Cys Gly Ser Ile Thr Ala Arg Phe Leu Arg His Tyr Pro Ala Ala
                85                  90                  95

Gln Ser Gly Thr Thr Val Gly Glu Pro Leu Ser Arg Phe Thr Leu Ala
            100                 105                 110

Ala Met Ser Ser Thr Asp Val Ala Trp Ala Glu Ser Asp Gln Ala Ser
        115                 120                 125
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Arg Ser Ala Glu Thr Phe Gly Gln Arg Thr Ser Ile Tyr Arg Gly Val
    130                 135                 140

Thr Arg His Arg Trp Thr Gly Arg Tyr Glu Ala His Leu Trp Glu Asn
145                 150                 155                 160

Ser Cys Arg Arg Glu Gly Gln Ser Arg Lys Gly Arg Gln Val Tyr Leu
                165                 170                 175

Gly Gly Tyr Asp Lys Glu Glu Lys Ala Ala Arg Ala Tyr Asp Leu Ala
            180                 185                 190

Ala Leu Lys Phe Trp Gly Pro Thr Thr Thr Thr Asn Phe Gln Val Ser
        195                 200                 205

Asn Tyr Glu Lys Glu Leu Glu Glu Met Lys Ser Met Thr Arg Gln Glu
    210                 215                 220

Phe Ile Ala Ser Leu Arg Arg Lys Ser Ser Gly Phe Ser Arg Gly Ala
225                 230                 235                 240

Ser Ile Tyr Arg Gly Val Thr Arg His His Gln His Gly Arg Trp Gln
                245                 250                 255

Ala Arg Ile Gly Ser Val Ala Gly Asn Lys Asp Leu Tyr Leu Gly Thr
            260                 265                 270

Phe Ser Thr Gln Glu Glu Ala Ala Glu Ala Tyr Asp Ile Ala Ala Ile
        275                 280                 285

Lys Phe Arg Gly Leu Asn Ala Val Thr Asn Leu Asp Met Ser Arg Tyr
    290                 295                 300

Asp Val Glu Ser Ile Leu Ser Ser Asp Leu Pro Val Gly Gly Gly Ala
305                 310                 315                 320

Ser Gly Arg Ala Ala Ala Lys Phe Pro Leu Asp Ser Leu Gln Pro Gly
                325                 330                 335

Ser Ala Ala Ala Met Met Leu Ala Gly Ala Ala Ala Ala Ser Gln Ala
            340                 345                 350

Thr Met Pro Pro Ser Glu Lys Asp Tyr Trp Ser Leu Leu Ala Leu His
        355                 360                 365

Tyr Gln Gln Gln Gln Glu Gln Glu Arg Gln Phe Pro Ala Ser Ala Tyr
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370 375 380

Glu Ala Tyr Gly Ser Gly Gly Val Asn Val Asp Phe Thr Met Gly Thr
385 390 395 400

Ser Ser Gly Ser Asn Asn Asn Thr Gly Ser Gly Val Met Trp Gly Ala
405 410 415

Thr Ser Gly Ala Val Val Gly Gln Gln Asp Ser Ser Ser Lys Gln Gly
420 425 430

Asn Gly Tyr Ala Ser Asn Ile Pro Tyr Ala Ala Ala Met Val Ser Gly
435 440 445

Thr Ala Gly Tyr Glu Gly Ser Thr Gly Asp Asn Gly Thr Trp Val Thr
450 455 460

Thr Thr Thr Ser Ser Asn Thr Gly Thr Ala Pro His Tyr Tyr Asn Tyr
465 470 475 480

Leu Phe Gly Met Glu
485

<210> 17
<211> 446
<212> PRT
<213> Sea mays

<400> 17

Met Ala Ala Thr Arg Arg Ala Phe Phe His Ser Ala Val Asp Gly Ile
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Ala Arg Ala Gly Pro Gly Glu Ala Glu Arg Leu Pro Ala Pro Pro Gln
20 25 30

Val Gly Arg Pro Val Glu Gly Ala Ser Ser Met Val Leu Gly Phe Pro
35 40 45

Val Pro Arg Pro Thr Met Pro Asp Arg Arg Pro Ala Ala Val Thr Gln
50 55 60

Gln Phe Phe Pro Pro Thr Thr Thr Ala Ala Gln Gln Ala Thr Met Glu
65 70 75 80

Glu Gln Cys His Val Pro Ala Gly Ser Ala Ala Glu Gln Trp Val Arg
85 90 95

Ser Ser Ala Ser Arg Lys Ser Arg Arg Gly Pro Arg Ser Arg Ser Ser

100 105 110

Gln Tyr Arg Gly Val Thr Phe Tyr Arg Arg Thr Gly Arg Trp Glu Ser
115 120 125

His Ile Trp Asp Cys Gly Lys Gln Val Tyr Leu Gly Gly Phe Asp Thr
130 135 140

Ala Gln Ala Ala Ala Arg Ala Tyr Asp Gln Ala Ala Ile Lys Phe Arg
145 150 155 160

Gly Leu Asn Ala Asp Ile Asn Phe Thr Leu Asp Asp Tyr Lys Asp Glu
165 170 175

Met Lys Lys Met Lys Asp Leu Ser Lys Glu Glu Phe Val Leu Val Leu
180 185 190

Arg Arg Gln Gly Ala Gly Phe Val Arg Gly Ser Ser Arg Phe Arg Gly
195 200 205

Val Thr Gln His Lys Cys Gly Lys Trp Glu Ala Arg Ile Gly Gln Leu
210 215 220

Met Gly Lys Lys Tyr Val Tyr Leu Gly Leu Tyr Asp Thr Glu Thr Glu
225 230 235 240

Ala Ala Gln Ala Tyr Asp Lys Ala Ala Ile Lys Cys Tyr Gly Lys Glu
245 250 255

Ala Val Thr Asn Phe Asp Ala Gln Ser Tyr Asp Lys Glu Leu Gln Ser
260 265 270

Gln Pro Trp Asp Gly Glu Leu Asp Leu Glu Leu Ser Leu Gly Cys Ala
275 280 285

Ser Ser Asp Pro Ser Thr Val Ala Val Glu Ala Phe Ser Pro Ala Thr
290 295 300

Ser Ser Ser Ser Arg Lys Gln Arg Thr Met Thr Leu Thr Leu Gly Leu
305 310 315 320

Pro Glu Glu Glu Glu Thr Gly Ala Gly Tyr Pro His Pro Ala Ala Gly
325 330 335

Met Phe Gly Arg Pro Ala Asp Gly His Val His Val Ala Pro Pro Pro
340 345 350

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His Arg Gln Trp Gln Gln Gln Gln Gly Gln His Ala Ala Pro Asp
        355                 360                 365

Ala Ala Pro Glu Arg Arg Ala Ala Glu Pro Ala Asp Arg Gln Arg Trp
    370                 375                 380

Gly Arg Gly Ala Arg Trp Pro Ile Ala Ser Ala Ser Gly Ile Asn Trp
385                 390                 395                 400

Ala Trp Ala Pro Pro Tyr Ala Thr Ala Arg Ala Gly Thr Asp Asp Asp
                405                 410                 415

Asp Ala Ser Ser Ala Ala Ala Ala Ala Ser Ser Gly Phe Pro Leu Trp
            420                 425                 430

Gln Leu Gly Ala Ala Ser Ser Arg Ser Ser Trp Pro Ser Cys
        435                 440                 445
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